

# **EXHIBIT 2**

UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION


ENTROPIC COMMUNICATIONS, )  
LLC, )  
Plaintiff, )  
vs. ) Civil No.  
2:22-CV-00125-JRG  
CHARTER COMMUNICATIONS, )  
INC., CHARTER SPECTRUM )  
ADVANCED SERVICES, LLC and )  
SPECTRUM MANAGEMENT HOLDING )  
COMPANY, LLC, )  
Defendants. )

The Zoom video deposition of RICHARD KRAMER,  
Ph.D., taken before Richard Derrick Ehrlich,  
Registered Merit Reporter, Certified Realtime  
Reporter, taken pursuant to the Federal Rules of  
Civil Procedure, commencing at 10:00 a.m., on the  
4th day of May, 2023.

<div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div>	<div>Page 2</div> <div>A P P E A R A N C E S</div> <div>On behalf of the Plaintiff:</div> <div>Katherine L. Allor</div> <div>Jason A. Engel</div> <div>K&amp;L GATES, LLP</div> <div>70 West Madison Street</div> <div>Suite 3100</div> <div>Chicago, IL 60602</div> <div>312.372.1121</div> <div>katy.allor@klgates.com</div> <div>jason.engel@klgates.com</div> <div>On behalf of the Defendants:</div> <div>David Benyacar</div> <div>ARNOLD, PORTER, KAYE &amp; SCHOLER, LLP</div> <div>250 West 55th Street</div> <div>New York, NY 10019</div> <div>212.836.8000</div> <div>david.benyacar@arnoldporter.com</div> <div>Videographer:</div> <div>Tim Tupiak</div>	<div>Page 4</div> <div>VIDEOGRAPHER: Good morning. We are going</div> <div>on the record. The time is 10:09 a.m. Central</div> <div>time on May the 4th, 2023.</div> <div>Quality of recording depends on quality of</div> <div>camera and Internet connection participants.</div> <div>What is heard from the witness and seen on the</div> <div>screen is what will be recorded.</div> <div>Audio and video recording will continue to</div> <div>take place unless all parties agree to go off</div> <div>the record.</div> <div>This is Media Unit Number 1 of the video</div> <div>recorded deposition of Dr. Richard Kramer taken</div> <div>in the matter of Entropic Communications, LLC,</div> <div>vs. Charter Communications, Inc., filed in the</div> <div>United States District Court for the Eastern</div> <div>District of Texas, Marshall Division, Case No.</div> <div>2:22-CV-00125.</div> <div>My name is Tim Tupiak, and I'm the</div> <div>videographer. The court reporter is Richard</div> <div>Ehrlich. We are both with the firm Veritext</div> <div>Legal Solutions.</div> <div>I'm not related to any party in this</div> <div>action, nor am I financially interested in the</div> <div>outcome.</div>
<div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div>	<div>Page 3</div> <div>I N D E X</div> <div>Page</div> <div>Exam by David Benyacar 5</div> <div>Exam by Katherine Allor 277</div> <div>Exam by David Benyacar 279</div> <div>E X H I B I T S</div> <div>Page</div> <div>Exhibit No. 1 - 6</div> <div>Exhibit No. 2 - 39</div> <div>Exhibit No. 3 - 58</div> <div>Exhibit No. 4 - 89</div> <div>Exhibit No. 5 - 125</div> <div>Exhibit No. 6 - 209</div> <div>Exhibit No. 7 - 247</div>	<div>Page 5</div> <div>Counsel will state their appearances and</div> <div>affiliations for the record beginning with the</div> <div>noticing attorney after which the reporter will</div> <div>administer the oath.</div> <div>MR. BENYACAR: My name is David Benyacar</div> <div>with the law firm of Arnold &amp; Porter</div> <div>representing Charter Communications.</div> <div>MS. ALLOR: Katy Allor from K &amp; L Gates on</div> <div>behalf of Entropic Communications, LLC. With me</div> <div>is my colleague Jason Engel. And I'm also here</div> <div>on behalf of the witness, Dr. Richard Kramer.</div> <div>RICHARD KRAMER, DEPONENT, SWORN</div> <div>EXAMINATION</div> <div>BY MR. BENYACAR:</div> <div>Q Good morning, Dr. Kramer.</div> <div>A Good morning.</div> <div>Q Let me see if I can use this fancy Exhibit Share</div> <div>technology.</div> <div>Katy, is it okay if we call these exhibits</div> <div>Kramer Exhibit X?</div> <div>MS. ALLOR: Sorry. Your audio is a little</div> <div>quiet compared to everyone else's.</div> <div>THE DEPONENT: Yeah. I'm having a hard</div> <div>time hearing you.</div>

<p style="text-align: right;">Page 122</p> <p>1 A So it can be considered a combination of</p> <p>2 electrical components interconnected to perform</p> <p>3 a particular task or function, yes.</p> <p>4 Q And that's what an integrated circuit is?</p> <p>5 I just want to make sure we're using --</p> <p>6 A A circuit. So --</p> <p>7 Q What about an integrated circuit?</p> <p>8 I'm trying to figure out what -- like,</p> <p>9 integrated circuit, is that some particular type</p> <p>10 of circuit? What makes it integrated?</p> <p>11 A Usually it means it's within a chip, in general.</p> <p>12 Q Does that mean it's its own chip?</p> <p>13 A It can -- again, the umbrella being, like, for</p> <p>14 instance, an ASIC. And I'm speaking in general</p> <p>15 terms, an ASIC is an application specific IC.</p> <p>16 And within that, you know, we're talking --</p> <p>17 there's SoCs as -- umbrella can be power supply,</p> <p>18 custom power supply chip, custom communications</p> <p>19 chip. So there's subsets. Not all integrated</p> <p>20 application specific ICs are SoCs. But within</p> <p>21 an SoC, as an example, or whatever, and there's</p> <p>22 no hard, fast, you know, terminology memorized</p> <p>23 dictionary version. I'm just trying to explain</p> <p>24 an SoC, as an example, can be considered to have</p>	<p style="text-align: right;">Page 124</p> <p>1 That's what -- you know, like I said, I don't</p> <p>2 disagree with the first part of the definition,</p> <p>3 A combination of electrical components</p> <p>4 interconnected to perform a particular task, as</p> <p>5 long as that task is known and there's a</p> <p>6 function that's assigned to that task.</p> <p>7 Like I said, the wireless, you know,</p> <p>8 circuit that I had described, that</p> <p>9 telecommunication circuit that I described.</p> <p>10 BY MR. BENYACAR:</p> <p>11 Q Yes, and I understand that. What I'm trying to</p> <p>12 figure out is if I were to look inside the SoC</p> <p>13 that you had worked on that you were testifying</p> <p>14 about, and I saw all the components inside but I</p> <p>15 didn't know what each component did, would I be</p> <p>16 able to tell one integrated circuit from another</p> <p>17 integrated circuit?</p> <p>18 A I don't know. You know, because then you're</p> <p>19 asking me if you could see the die and what was</p> <p>20 on the die and how it was laid out on the die,</p> <p>21 and I believe we laid the circuits out</p> <p>22 separately in their own, you know, quadrants or</p> <p>23 whatever, you know, areas. You're asking me to</p> <p>24 speculate on something.</p>
<p style="text-align: right;">Page 123</p> <p>1 within it separate, integrated circuits.</p> <p>2 Integrated being integrated. I mean, that's</p> <p>3 what the word means.</p> <p>4 We're kind of switching back and forth</p> <p>5 between chips. I'm just trying to be clear.</p> <p>6 We're switching -- there's a form factor and</p> <p>7 then there's what's inside the chip. Sometimes</p> <p>8 those terms are interchangeably loosely used.</p> <p>9 But, you know, how I look at it is an ASIC is</p> <p>10 application specific within there, there's a</p> <p>11 subset, and it's me personally, generally</p> <p>12 speaking, without asked to give a formal</p> <p>13 definition, there's an SoC. An SoC can have</p> <p>14 separate, integrated circuits inside the chip.</p> <p>15 Inside there's a physical chip.</p> <p>16 Q And so the different integrated circuits, you</p> <p>17 know what they are because they're components</p> <p>18 that perform one function or a different</p> <p>19 function; is that right? Or is there some</p> <p>20 physical manifestation of the fact that there</p> <p>21 are separate, integrated circuits?</p> <p>22 MS. ALLOR: Object to the form.</p> <p>23 THE DEPONENT: So I don't know what you</p> <p>24 mean by -- so they can be defined functionally.</p>	<p style="text-align: right;">Page 125</p> <p>1 But I think, you know, clearly we designed</p> <p>2 the circuits that were collections of components</p> <p>3 that were, you know, logically grouped for the</p> <p>4 function that they performed. And I believe</p> <p>5 physically you could probably look at the die</p> <p>6 and at least at a high level identify where</p> <p>7 those were located.</p> <p>8 Q Okay. And would you agree with me that a System</p> <p>9 on Chip is itself a circuit?</p> <p>10 A Outside the context of the patent, I've not been</p> <p>11 asked to consider all different possibilities.</p> <p>12 In general, and speculatively, it could be</p> <p>13 considered a separate circuit outside of the</p> <p>14 scope of the patents.</p> <p>15 Q So let me just -- I'm going to introduce what</p> <p>16 I'm marking as Kramer Exhibit 5.</p> <p>17 (Exhibit No. 5 marked.)</p> <p>18 BY MR. BENYACAR:</p> <p>19 Q Let me know when you -- when that pops up for</p> <p>20 you, Dr. Kramer.</p> <p>21 This is the excerpt from Newton's Telecom</p> <p>22 Dictionary, Copyright 2001.</p> <p>23 Let me know when you have that open.</p> <p>24 A I clicked on it. It showed up. I'm still</p>

<p style="text-align: right;">Page 126</p> <p>1 waiting for it.</p> <p>2 Q Okay. Let me know when you see it.</p> <p>3 A I see it. And can you tell me, just so I can</p> <p>4 follow you with hard copy, or I can just look.</p> <p>5 Q You don't have the hard copy of this one, so</p> <p>6 unfortunately you're going to have to go -- it's</p> <p>7 very short. It's on the third of three pages of</p> <p>8 the PDF.</p> <p>9 A Okay.</p> <p>10 Q And on the left, you will see that there is a</p> <p>11 definition of System on a Chip. Let me know if</p> <p>12 you see that?</p> <p>13 A Okay. I just have to read it.</p> <p>14 MS. ALLOR: You should be able to zoom in</p> <p>15 if you hover near the bottom of the page.</p> <p>16 THE DEPONENT: Yeah, that's what I'm trying</p> <p>17 to figure out.</p> <p>18 BY MR. BENYACAR:</p> <p>19 Q Just let me know when you're ready, Doctor.</p> <p>20 A I'm reading. There's a lot to unpack here, so</p> <p>21 just bear with me. I'm just trying to read</p> <p>22 through this.</p> <p>23 Q Well, I'll just ask you my question, and you can</p> <p>24 read whatever you think you need to read. But</p>	<p style="text-align: right;">Page 128</p> <p>1 odd, you know.</p> <p>2 Q Okay. Well, when you say it's a bit odd, you</p> <p>3 don't think it's odd that it would be called an</p> <p>4 integrated circuit, right?</p> <p>5 A It's just a fact that -- it's not odd that it's</p> <p>6 called an integrated circuit. System on a Chip,</p> <p>7 as I had explained in the example, the System on</p> <p>8 a Chip that I explained to you, we had separate,</p> <p>9 integrated circuits. They had defined</p> <p>10 functions; for instance, for the radio and for</p> <p>11 the telecommunications. And so to that --</p> <p>12 you know, so there were separate, integrated</p> <p>13 circuits within the SoC. That's why it's called</p> <p>14 a System on a Chip. And they talk about that.</p> <p>15 It's rather quirky and they say, Well, you know,</p> <p>16 you can kind of implement this by, you know,</p> <p>17 predefined components, and they kind of parallel</p> <p>18 it with circuit boards.</p> <p>19 So we had -- and one would understand</p> <p>20 circuits in the context of design. When people</p> <p>21 had specific roles, they designed a particular</p> <p>22 circuit for a particular function. It doesn't</p> <p>23 really make that clear in this definition.</p> <p>24 That's the quirky part.</p>
<p style="text-align: right;">Page 127</p> <p>1 my question is simply: Do you see the</p> <p>2 definition begins, SoC, System on Chip, a</p> <p>3 silicon integrated circuit?</p> <p>4 I'm just asking about that. Do you see</p> <p>5 that?</p> <p>6 A I see that.</p> <p>7 Q You don't disagree with that, do you?</p> <p>8 A I would like to have the benefit of reading the</p> <p>9 whole thing.</p> <p>10 Q Let me know when you're done.</p> <p>11 A Thank you.</p> <p>12 So your question again, please?</p> <p>13 Q You don't agree with the statement -- you don't</p> <p>14 disagree with the statement that says that a</p> <p>15 System on a Chip is a silicon integrated</p> <p>16 circuit, do you?</p> <p>17 A It is -- I don't disagree with that. Some of</p> <p>18 the characterizations and implementation details</p> <p>19 I think are a bit different than having</p> <p>20 experienced. But, in general, you can consider</p> <p>21 as one definition, a System on a Chip can be</p> <p>22 considered an integrated circuit.</p> <p>23 So the characterization that's given --</p> <p>24 and, again, this is one definition -- are a bit</p>	<p style="text-align: right;">Page 129</p> <p>1 Q So you don't disagree that you can have circuits</p> <p>2 within circuits, right?</p> <p>3 A There can be circuits within circuits if we</p> <p>4 ignore the claims and just speculate. In</p> <p>5 general, there can be subcircuits.</p> <p>6 Q Now, the specification of the '775 patent does</p> <p>7 not use the word "circuit," does it?</p> <p>8 And, again, just to be clear, by the</p> <p>9 specification, I'm excluding the claims.</p> <p>10 A One skilled in the art in reviewing this</p> <p>11 specification would understand "circuit." But</p> <p>12 if you do -- and, in fact, it talks about a chip</p> <p>13 at least twice. Implementation on a chip, so</p> <p>14 it's clear.</p> <p>15 But if I were to do a search outside of the</p> <p>16 claims, claims fully inform me, but I don't</p> <p>17 think the word "circuit" would show up on that</p> <p>18 search, but I'm not sure.</p> <p>19 Q Okay. Let me just make sure I understand your</p> <p>20 answer. You said that the specification does</p> <p>21 talk about a chip.</p> <p>22 Are you saying that chip and circuit are</p> <p>23 synonymous?</p> <p>24 A One skilled in the art would understand it.</p>

<p style="text-align: right;">Page 298</p> <p>1 blocks but the CME blocks that are identified as</p> <p>2 part of the DOCSIS controller would be</p> <p>3 implemented -- or could be implemented in</p> <p>4 portions of another processor or the same</p> <p>5 processor. I've not gone through that analysis.</p> <p>6 BY MR. BENYACAR:</p> <p>7 Q So as you sit here today, you can't answer my</p> <p>8 question because you haven't done that analysis;</p> <p>9 is that right?</p> <p>10 A That's correct.</p> <p>11 MR. BENYACAR: Okay. I have nothing else.</p> <p>12 Thank you.</p> <p>13 THE DEPONENT: Thank you.</p> <p>14 MS. ALLOR: Thanks.</p> <p>15 VIDEOGRAPHER: Are we ready to go off the</p> <p>16 record?</p> <p>17 MR. BENYACAR: Yes.</p> <p>18 MS. ALLOR: Yep.</p> <p>19 THE DEPONENT: Yeah. If you have questions</p> <p>20 for me --</p> <p>21 VIDEOGRAPHER: We are going off the record.</p> <p>22 The time is 7:11 p.m. This concludes today's</p> <p>23 testimony.</p> <p>24 Total number of media units used was seven,</p>	<p style="text-align: right;">Page 300</p> <p>1 CERTIFICATE</p> <p>2</p> <p>3 I, Richard D. Ehrlich, a Certified Shorthand</p> <p>4 Reporter of the State of Illinois, CSR License No.</p> <p>5 084-2019, do hereby certify that I stenographically</p> <p>6 reported the proceedings had at the Zoom video</p> <p>7 deposition, as aforesaid, and that the foregoing</p> <p>8 transcript is a true and accurate record of the</p> <p>9 proceedings had therein.</p> <p>10 IN WITNESS WHEREOF, I do set my hand at</p> <p>11 Chicago, Illinois, this 8th day of May, 2023.</p> <p>12</p> <p>13 </p> <p>14</p> <p>15 RICHARD D. EHRLICH</p> <p>16 Certified Shorthand Reporter</p> <p>17 License No. 084.004018</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p>
<p style="text-align: right;">Page 299</p> <p>1 and they will be retained by Veritext Legal</p> <p>2 Solutions.</p> <p>3 (Signature reserved.)</p> <p>4 (Zoom video deposition concluded.)</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p>	<p style="text-align: right;">Page 301</p> <p>1 Katherine Allor, Esq.</p> <p>2 kathy.allor@klgates.com</p> <p>3 May 8, 2023</p> <p>4 Entropic Communications LLC v Charter Communications Inc. et al</p> <p>5 5/4/2023, Dr Richard Kramer (#5900604)</p> <p>6 The above-referenced transcript is available for</p> <p>7 review.</p> <p>8 Within the applicable timeframe, the witness should</p> <p>9 read the testimony to verify its accuracy. If there are</p> <p>10 any changes, the witness should note those with the</p> <p>11 reason, on the attached Errata Sheet.</p> <p>12 The witness should sign the Acknowledgment of</p> <p>13 Deponent and Errata and return to the deposing attorney.</p> <p>14 Copies should be sent to all counsel, and to Veritext at</p> <p>15 cs-ny@veritext.com.</p> <p>16</p> <p>17 Return completed errata within 30 days from</p> <p>18 receipt of testimony.</p> <p>19 If the witness fails to do so within the time</p> <p>20 allotted, the transcript may be used as if signed.</p> <p>21</p> <p>22 Yours,</p> <p>23 Veritext Legal Solutions</p> <p>24</p> <p>25</p>